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The Catabolic turn: Navigating socio-environmental disruption and material negativity

Yuri Di Liberto[1]

Abstract

The Anthropocene has pushed thinkers to reconsider the agency of humans on natural historicity. Against the backdrop of idealism, different scholars have recently pointed out how human history has become increasingly dependent on how human action shapes the environment itself. Marxist authors, in turn, point out how environmental disruption caused by over-exploitation provokes a "metabolic rift" between humanity and nature. However, until now no account has explored what a post-metabolic reality might entail. The increasing desertification of various regions of the world, along with the transformation of critical zones into irreversibly unusable and uninhabitable ones calls for the concept of a "catabolic turn", as opposed to "metabolic". Catabolism is a condition in which an organism feeds on itself due to inaccessibility of resources. In this paper we define contemporaneity in terms of a global catabolic turn and explore its social and political repercussions.

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Introduction: towards social catabolism

With the introduction of the term *Anthropocene* by Paul Crutzen and Eugene Stoermer in the year 2000[2], most of the philosophical and scientific reflections on humanity and its history have undergone a true paradigm shift. As is now widely known, the term designates the advent of a new geological era characterized by being the result of human activity itself. The global activities of humanity have altered the environment, climate, soil, etc., to such an extent that they have determined the beginning of a new era: from the Holocene to the Anthropocene.

Placing the advent of the Anthropocene in temporal terms is still a matter of debate, although the most widely accepted proposal is to date its beginning to the mid-20th century, specifically from 1945 onwards.[3] Despite the fact that the most significant leap toward the Anthropocene was driven by fossil fuel-based extractive activities, Timothy Morton defines the entire humanization of the Earth as a macroscopic (and pathological) *agrilogistic* operation, which, as such, should be backdated even to the era of the Fertile Crescent, i.e.,

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[2] Crutzen and Stoermer, "The Anthropocene", 17-18.

[3] Lewis and Maslin, "Defining the Anthropocene", 171-178. See also McNeill and Engelke, *The Great Acceleration. An environmental history of the Anthropocene since 1945*.

[4] Morton, *Dark Ecology*.

the early Neolithic agricultural developments around 10,000 BC.[4] The application of logistics to cultivation, Morton argues, would already mark the deep preconditions for the recent drift into the Anthropocene.

Regardless of the various theoretical nuances of the term, the advent of the Anthropocene coincides with the deterioration and often irreversible alteration of the Critical Zone. This term refers to the "near-surface terrestrial environment from the bottom of circulating groundwater to the top of vegetation, [which] hosts the complex interactions involving rock, soil, water, air, and living organisms that regulate life-sustaining resources".[5]

The term was initially used in 1998 by Gail Ashley in a presentation at the Geological Society of America[6], and was adopted in 2001 by the United States National Research Committee to highlight the importance of this concept in the integrated study of various disciplines.[7] Climate change and soil degradation have increasingly accelerated the depletion and destruction of ever larger portions of the Critical Zone.

The Critical Zone is neither a two-dimensional area nor a political space. According to Latour, the term refers to "a spot on the envelope of the biosphere" which extends both vertically "from the top of the lower atmosphere to the sterile rocks", and horizontally "wherever it is possible to obtain reliable data on the various fluxes of ingredients flowing through the chosen site (which in practice generally means water catchments)".[8]

Therefore, the Critical Zone must not be equated with a portion of a map or with a geometrical section of a plane, but rather with the ever-transforming and self-reproducing topological volume represented by the interaction of biological and non-biological entities[9]. Zones, says Latour, appear "patchy, heterogeneous, discontinuous".[10] This topomorphological nature of the Critical Zone gives it a "leopard skin nature".[11]

Part of the effects of the Anthropocene consists also in the tangible transformation of areas of the Earth into unusable and uninhabitable zones. For this reason, the speculative counterpart of the concept of the Critical Zone is the desert. Soil degradation, caused both by overexploitation and climate change, while most affecting regions of the world such as Sub-Saharan Africa and Asia, is no longer an isolated phenomenon confined to those areas, as it now also affects more temperate regions. In the United States, for example, nearly 40% of Southern states are already facing serious drought problems.[12] Similarly, Southern Europe has recently experienced some of the worst droughts in recent years. In Spain, for instance, "desertification and overexploitation

[5] Richardson, "Critical Zone", 1.
[6] Gail Ashley, "Where are we headed? 'Soft' rock research into the new millennium," *Geological Society of America Bulletin* 30: A-148, cited in *ibid.*
[7] See Lee, Shoshitaishvili, Wood, Bekker, and Abbott, "The meanings of the critical zone," for an overview of the meanings used. In this article, we will mostly refer to what the authors call "first order meanings (ontological): CZ as life's place or the processes sustaining it".
[8] Latour, "Some advantages of the notion of 'Critical Zone' for geopolitics", 4.
[9] Derek Woods rightly pinpoints: "Scale variance helps to show that the terraformers are also non-humans such as cows, genres, starlings, corn, nitrogen molecules, oil, computers, methanogenic archaea, and refineries". See Woods, "Scale critique for the Anthropocene", 139.
[10] Latour, "Seven objections against landing on earth", 3.
[11] Latour, "Some advantages of the notion of 'Critical Zone' for Geopolitics", 4.
[12] Willige, "What is desertification and why is it important to understand?"
[13] *Ibid*.

have severely affected what's known as 'Europe's Kitchen Garden' ".[13]

Desertification is not only a concrete phenomenon related to the Critical Zone, but also, more broadly, to the possibility for humans to inhabit one place or another on the planet. According to some estimates, "if carbon emissions were to rise to extreme levels, by 2070 at least four million Americans could find themselves living in areas unsuitable for human life".[14]

The phenomena of global warming and extreme temperatures, which paradoxically impact most heavily the populations that contribute the least to them[15], rendering many lands unfit for cultivation, are also contributing to the rise of new diasporic communities and corridors of climate-related migration.

The issue of desertification has become so significant that the European Commission has made available a *World Atlas of Desertification*[16], where maps of its progression can be observed.

Desertification and desert therefore simultaneously signify: (1) the destruction of the possibilities for sustaining and reproducing life in the Critical Zone; (2) the becoming uninhabitable of a given area; (3) the creation of a new type of boundary that would separate different zones/groups based on their degree of exposure to the Anthropocene itself. This latter sense implies the existence of what Mbembe has called "dead spaces of non-connection," which would thus contradict the very idea of a "shared planet".[17]

In fact, what needs to be emphasized is that the destructive phenomena of the Anthropocene are not evenly distributed across the Earth's surface or across different populations. As Shimshon Bichler and Jonathan Nitzan note, issues like "water problems, peak energy, massive population movements, genetic engineering, species extinction", and other events, have "harmful consequences [that] are not necessarily harmful to everyone, and certainly not to the same extent".[18] To paraphrase a well-known formula by Jacques Lacan: destruction is *not-all* (pas-tout).[19]

Not only are the responsibilities for climate change not evenly distributed among nations, peoples, or groups on this planet, but neither are its pernicious effects. The idea of a uniform and instantaneous catastrophe for humanity does not reflect the reality of ongoing processes. The irreversible modification and erosion of the Critical Zone imply a catastrophe "in the sense of a profound change instead of a mere destruction".[20]

Many contemporary Marxists emphasize Marx's concept of social metabolism, sometimes simply referred to as metabolism. These critical approaches have highlighted how Marx allows us to theorize, from the perspective of capitalist exploitation, the rift in the physiological exchange between humans and nature. Capitalism has led to the destruction of this physiological exchange by imposing excessive exploitation and irreversible alterations, thereby rupturing the metabolism between humanity and the natural environment. The contemporary crisis consists in the fact that "the cycle of passing and

[14] Lustgarten, "Così il clima ridisegna (forse) l'America", 148 (https://www.limesonline.com/rivista/cosi-il-clima-ridisegna-forse-l-america-14636952/).
[15] See the 2011 report of the Food and Agriculture Organization of the United Nation (FAO), *The State of the World's Land and Water Resources for Food and Agriculture. Managing systems at risk*, 120.
[16] European Commission, "World atlas of desertification". https://wad.jrc.ec.europa.eu/geoportal.
[17] Mbembe, *Necropolitics*, 99.
[18] Bichler and Nitzan, "The CasP project: Past, present, future," 23.
[19] Lacan, *Le Séminaire. Livre XX: Encore*, 54.
[20] Gisinger, "Catastrophic Times", 66.
[21] Grove, *Savage Ecology*, 51.

renewal has been interrupted by the metabolic rift of modern human animals".[21]

This article, after briefly exploring the idea of the metabolic rift, proposes the substitute concept of a global *catabolic turn*. In fact, what is missing from these theoretical approaches is a vision of a post-metabolic landscape. By drawing on the concept of catabolism, as opposed to metabolism, I propose the idea that our contemporary global reality has entered a catabolic phase.

Catabolism (καταβάλλειν) derives from the Greek κατά and βάλλω, meaning "to throw down". In biological terms, catabolism refers to the part of an organism's metabolic process in which larger and more complex molecules are broken down into smaller ones to produce energy.[22] Its opposite is anabolism, a process by which new structures are instead formed and stored. However, I use the term not merely as a counterpart to anabolism, but rather to speculate beyond the idea of the metabolic rift, using it to describe a generalized regime shift characterized by the prominence of a catabolic mode of functioning. An organism, when external resources are unavailable, enters a catabolic regime, dismantling and consuming its own tissues in order to survive. The constraints and limits now reached by global capitalism in the Anthropocene allow us to apply this idea through a scalar analogy. That is, we can consider global capitalism and humanity's footprint as the macroscopic "organism" whose metabolism depends on Earth's resources. This is, of course, a useful analogy rather than an ontological equivalence.

Climate change has already happened. Our narrative and temporal bias leads us to speak of it in the gerund: the climate is chang*ing*. But its material effects, as well as the political, social, and economic reconfigurations, are already here. Hence, climate change has happen*ed* – rather than *it's happening.*

The idea of a catabolic turn also implies a rethinking of the relationships between capital/power and material realities. The erosion of the Critical Zone, of which desertification is the central paradigm, does not imply the end of capitalism: capitalism is concerned with profit, which are financial values, not (only) material resources. As Alliez and Lazzarato say, catastrophe represents "an opportunity" for capitalism to transition "from one mode of valorization to another".[23]

In a catabolic turn, while it may shrink in space, it coagulates in power. The erosion of material possibilities implies a morphological change in power, which increasingly assumes an agglutinated and elitist form. In the catabolic phase, there is also an increased reliance on direct forms of violence and dispossession to gain an advantage over others.

I take the catabolic turn, therefore, to also encompass general social and psychological repercussions. One of these repercussions is the exacerbation of Manichaean ethical or moral positions. In the accelerated and exceptional state of contemporary catabolism, social positions and stances tend to polarize, adopting increasingly simplified attitudes toward others (such as good vs. evil, or us vs. them). Past historical examples of similar patterns are well-documented, such as the scapegoating of women "witches" for allegedly causing harsh climate conditions and poor harvests.[24] Of course, nobody today is blaming witches, but the structural preconditions for general social distress are once again present, this time on a global scale.

Therefore, the catabolic turn is a broad epochal diagnosis that entails both material aspects, such as the deterioration of concrete

[22] Bolster, "Glossary of terms used in bioinorganic chemistry: catabolism".
[23] Alliez and Lazzarato, *Guerres et Capital*, 395
[24] Behringer, "Weather, Hunger and Fear: Origins of the European Witch-Hunts in Climate, Society and Mentality", 1-27.

material conditions, as well as social and power dynamics, which are in turn its effects.

The end of metabolism: material negativity and zones of unavailability

As Chakrabarty pointed out, it is precisely the Anthropocene that entails "the crisis of the age-old humanist distinction between natural history and human history".[25]

Chakrabarty's explicit reference is also to some epigones of dialectical materialism, more precisely to Stalin's dogmatic version. In his theoretical intervention on *Dialectical and Historical Materialism*, Stalin explicitly denies that the conditions shaping the society's structure can be determined by environmental conditions. Although the "geographical environment" is important, says Stalin, its "influence is not the determining influence".[26]

A similar perspective is implicitly present in Hegel's dialectical framework, in which energy-material considerations are largely absent because the time of the Spirit (*Geist*) does not correspond to material time.[27] The spirit of the world, says Hegel, "has time enough" because it is "outside of time, it is eternal".[28]

For this very reason, things like "time, effort, expenditure"[29] belong to material life, but not to the Spirit. The division between natural history and human history is thus justified by the inability to think of a morphological feedback from the material time of human affairs on the very natural preconditions that make them possible (i.e., the Anthropocene itself), or, in other words, the inability to conceive how material events caused by *Geist* can have a recoil on its material preconditions, thereby limiting and diverting its actual course.[30]

Things are different for Marx. Marx already defines labor itself in terms of a metabolic exchange: "Labour is, first of all, a process between man and nature, a process by which man, through his own actions, mediates, regulates and controls the metabolism between himself and nature".[31]

The concept of metabolism, or organic exchange (*Stoffwechsel*)[32], is extended from its origin in chemistry, through organic biology, to encompass the entire set of relationships and exchange cycles between nature and society. If, at the level of an organism, metabolism consists of the operations that transform substances or resources into organic forms or structures (with the production of waste), at the level of larger systems like society, it refers to the processes that allow a society to maintain its structures by transforming incoming resources (and producing waste as

[25] Chakrabarty, *Clima, Storia e Capitale*, 56.
[26] Stalin, *Dialectical and Historical Materialism*, 25. Other Marxists share this idea of a separation between natural dialectics and historical dialectics in the form of an anti-Engelsian position. See for example Schmidt, 1993.
[27] An analogous remark is made by Tarancón in reference to specifically Foucault and Esposito: "Energy is the great forgotten of biopolitics in the 20th century". See Tarancón, "Rethinking Biopolitics in the Anthropocene", 193.
[28] Hegel, "Introduzione alla storia della filosofia", 573.
[29] Hegel, *Vorlesungen über die Geschichte der Philosophie*, 36.
[30] Hamilton, Gemenne and Bonneuil, align with my critique of the lack of energetic considerations when they pinpoint that "modern humanities and social sciences have pictured societies as if they were above material and energy cycles and unbound by the Earth's finiteness and metabolisms. Now they must come back to Earth" (*The Anthropocene and the global environmental crisis*, 4).
[31] Marx, *Il Capitale. Libro primo*, 273. Our italics.
[32] See Angus, "Marx and metabolism: lost in translation?", 1-3, for the origin of the term and its meanings in the Marxian corpus. See also Foster, "Marx's theory of metabolic rift: classical foundations for environmental sociology".

output). As Saito emphasizes: "The modern concept of metabolism can be applied not only to organic bodies but also to various interactions in one or more ecosystems, even on a global scale".[33]

In this case, it is referred to as social metabolism. It is from this important concept of metabolism that Marx speculates on the possibility that capitalism could disturb and destroy the very conditions that allow metabolism to endure, causing an irreparable rift. "Large landed property," Marx contends, "produces conditions that provoke an irreparable rift in the interdependent process of social metabolism, a metabolism prescribed by the natural laws of life itself".[34]

The central aspect of the concept of metabolism is that it "constitutes the basis on which the complex web of interactions necessary to life is sustained, and growth becomes possible".[35] For this reason, therefore, saying that global capitalism created a metabolic rift "between human beings and the soil was to argue that the nature-imposed conditions of sustainability had been violated".[36]

Any metabolic process must contend with the fact that resources are not unlimited and are subject to consumption or depletion. Moreover, it must also reckon with the fact that every metabolic process always produces some kind of waste. As Clark, Foster, and Longo state:

> The demands of capital are imposed on nature, increasing the pressures placed on ecological systems and the production of wastes, generating distinct metabolic rifts (or ruptures) between both the social metabolism itself and the wider universal metabolism, consisting of various natural cycles and processes.[37]

Different instances of metabolic rupture are already present in the form of a radical and often irreversible destruction of portions of the Critical Zone, portions which have become zones of radical unavailability, both in the sense of unavailability to life cycles – including resource regeneration and soil degradation – and unavailability to human life.

This is already true in the case of so-called sacrificial zones, that is, zones considered incompatible with human settlements and that are slowly being abandoned. In our global catabolic reality, poorer communities are already being registered into planned retreats, while the wealthiest ones are creating physical barriers and forms of defensive containment.[38]

The Anthropocene, rather than a total and abrupt annihilation of human and non-human life altogether, is a form of *geographic Darwinism*. During an Exxon meeting to assess the role of fossil fuels in causing climate change, held in July 1977, a scientist working for Exxon, James F. Black, could be heard saying that "rainfall could become heavier in some regions, and other places could become deserts. Some countries would benefit but others would have their agricultural output reduced or destroyed".[39] Latour himself comments on the fact that Exxon-Mobil knew very well in advance the consequences of its own actions: "These people […] understood that, if they wanted to survive in comfort, *they had to stop*

[33] Saito, *L'ecosocialismo di Karl Marx*, 89.
[34] Marx, *Capital. Volume 3*, 949.
[35] Foster, *Marx's Ecology*, 163.
[36] *Ibid.*
[37] Clark, Foster, and Longo, "Metabolic rifts and ecological crisis", 652.
[38] Slobodian, *Il capitalismo della frammentazione*, 270. See Koslov, "The case for retreat", 359-387.
[39] Cited in Banerjee, Cushman, Hasemyer, and Song, "Exxon. The road not taken", https://insideclimatenews.org/book/exxon-the-road-not-taken/.

pretending, even in their dreams, to share the earth with the rest of the world".[40]

They understood, in other words, the intrinsic *zonified* nature of what was about to happen, the *not-all* (pas-tout) of deterioration. It is only by taking into account this idea that the geographical Darwinism of the Anthropocene can be understood. By the same token, the Anthropocene can't be fully understood without taking into account how processes of extreme environmental exploitation are a direct consequence of colonial practices. Hence, the "fate of landscapes and ecosystems" cannot be dissociated from "how colonialism is understood"[41]

And if we zoom in at the scale of local regional patterns and households, another form of already existing geographic Darwinism has to do with the uneven access that different populations have to forms of heat mitigation, like the use of AC.[42] Since AC use will not be affordable, both energetically and economically, for people with lower incomes, "large fractions of the population will remain vulnerable to acute heat".[43]

The idea of a catabolic turn inherits from the idea of metabolic rift the concept of rupture and exhaustion, but radicalizes it by suggesting a world filled with scattered material negativities and an already catabolic global reality – a reality involving both material and immaterial aspects. As noted by David Bissell, to exhaust (or exhaustion) "names an array of related but distinct concerns".[44]

It encompasses the idea of making a body feel "tired," but it also means " 'to empty' in the sense of using up reserves completely," and, moreover, it also means " 'to expel' in terms of the removal of a by-product".[45]

What we need to learn to think about, therefore, is a form of negativity that cannot be catalyzed towards any kind of progress – a form of radical negativity as a concrete limit. According to Rose, Bissell, and Harrison, it is necessary to think of "negative geographies" that seriously center "*the question of limits: the limits of capacities, powers, and relations*".[46]

The idea of post-metabolic zones of unavailability implies the abandonment of a "conception of the negative as transaction – as passage".[47] If it is true that the mechanism of negation functions in the Western philosophical canon (Hegel, Marx, Freud, etc.) as a potential means or step to generate a higher-order truth[48], the catabolic drift instead implies the emergence of insurmountable negativities, immune to sublation, so to speak.[49]

Sociologist Hartmut Rosa also elevates the category of unavailability (*Unverfügbarkeit*)[50] to an intrinsic limit of our way of seeing the world. According to Rosa, the aggressive, predatory, and controlling attitude toward the world is

[40] Latour, *Down to Earth*, 19.
[41] Ferdinand, *Decolonial Ecology*, 122.
[42] Falchetta, De Cian, Pavanello, and Wing, "Inequalities in global residential cooling energy use to 2050", 1-13.
[43] *Ibid*., 2.
[44] Bissell, "Liminal geographies of exhaustion", 139.
[45] *Ibid.*
[46] Rose, Bissell, and Harrison, "Negative geographies", 3.
[47] *Ibid*..
[48] Horn, *A Natural History of Negation*, 94.
[49] In a similar way, Neyrat talks of an always unconstructable wild, representing the "transcendental dark side of counterlining" to every form of earthly destructive or constructive action. See Neyrat, *The unconstructable Earth*, 163. See also Pohl, "Apocalyptic nothingness: lacks, holes, and the limits of the geographical imagination", where the distinction between spatial nothingness and a more radical spatial collapse is articulated through the Lacanian concepts of "lack" (manque) and "hole" (trou) respectively.
[50] Rosa, *Unverfügbarkeit*, 12.

now being challenged by the emergence of concrete and insurmountable limits that call this very attitude into question, as in the case of ski resorts facing crisis due to climate change, since the costs of creating artificial snow have become exorbitant.[51]

According to Jason Moore, these new limits consist in the recent unavailability of "extra-human natures to yield their work for free".[52] For instance, food is becoming more expensive to produce, and oil extraction is becoming increasingly costly, and so on. He adds, however, that "far from denying geological and biophysical realities", such limits already exist as ones artificially created by capitalism itself, a situation only exacerbated by climate change.[53]

What is at stake, in other words, is the distinction between crises artificially caused by the capitalist system itself – forms of artificial scarcity or controlled unavailability – and real, or Malthusian, crises, where physical resources are truly unavailable, regardless of the ebb and flow of financial values. With the progressive worsening of conditions in different areas of the world and the concrete existence of what I have just called material negativities or zones of unavailability, we are, however, fully within a catabolic scenario in which pseudo-Malthusian (i.e., real) scarcity must be considered also a determining factor, just as important as the artificial scarcity caused by the price system and capital dynamics. Capitalism is also a metabolization of space.

The catabolic turn

A paradigmatic example of this material unavailability is given by the increasingly poor returns of traditional extraction methods. In oil extraction, the energy used to extract it must be as low as possible compared to the energy obtained. In industry jargon, this is called *Energy Return On Energy Invested* (EROI). As noted by Servigne and Stevens, all EROIs are declining, and they are doing so at an increasingly rapid pace. This decline forces the use of more expensive techniques and infrastructure just to maintain the same level of production.[54]

To sustain itself, our civilization, subject as it is to inevitable geophysical constraints and limits, can pursue two different strategies. The first strategy consists of downsizing itself, rebalancing resource use for its reproduction at a level of mere maintenance. The other solution is to forcibly prolong growth and resource accumulation through military conquest, new technologies, new aggressive forms of exploitation, extraction, and so on. If a society, Greer notes, continues to grow in production while showing clear signs of "depletion of key resources", then it "may be considered a potential candidate for catabolic collapse".[55] Here, however, I prefer to speak about a catabolic turn, rather than a collapse. The reason for this has to do with the scale being considered, which is global, not that of a single society.

All the complex societies on this planet, i.e., nations, are essentially dependent on the energy provided by basic resources like fossil fuels. This dependence is such that their complexity, size, and power are a *function* of how much energy they can extract from the material world. The more powerful they are, the more energy-consuming they must be to maintain their power. In other words, highly

[51] *Ibid*., 8.
[52] Moore, *Antropocene o Capitalocene? Scenari di ecologia-mondo nell'era della crisi planetaria*, 129.
[53] *Ibid*., 130.
[54] Servigne and Stevens, *Convivere con la catastrofe*, 49.
[55] Greer, "How civilizations fail: a theory of catabolic collapse", 6.
[56] Bichler and Nitzan, "Growing", 37.

complex and hierarchical structures are, from a socio-biophysical point of view, extremely dependent on *energy capture*.[56]

This is why resource depletion, soil degradation and overexploitation matter. As noted by Heinberg:

> The depletion of resources results from our pursuit of power in the present, but depletion limits humanity's pursuit of power in the future. We all contribute to resource depletion when we buy goods, use energy, and dispose of thrash. The more power we have, the more stuff we can consume. The bigger the scale of our collective human metabolism, and the faster it grows, the more we deplete the environment.[57]

Since this vicious cycle reproduces itself on a global scale, and since no major power decides to withdraw from this dynamic, the idea of mere adaptation to the given situation has gradually replaced any action to halt the effects of climate change and the concomitant depletion of resources. As Mann and Wainwright note, "*adaptation is becoming the 'progress' of our times*".[58]

The catabolic turn can thus be unpacked into three axes. The geographical one, which has to do with the ontology of zones and the irreversible mutation of Earth's morphology. The power/economy axis, which concerns how power and financial capitalism synchronize with the world to maintain their advantage in this pseudo-Malthusian scenario. Thirdly, we have a social axis, which is about how individuals and groups reorient moral stances, actions, and discourses in order to survive in a catabolic reality. All three axes are always interacting, and it is only for the sake of theoretical analysis that we explore them separately.

We've already discussed the geographical aspect in terms of desertification and negative geographies. Desertification does not equate with the total annihilation of human spaces; rather, it means the morphological shrinking and deforming of the Critical Zone. The conjunction of decreasing resource availability and desertification determines a catabolic shift at the global scale. This does not imply an erasure of the living multiplicities of the Critical Zone, but rather its topological reshaping. This, in turn, implies a redistribution of zones of advantage and disadvantage. Rather than the end of the World with a capital 'W', the catabolic turn is about the end of some *w*orlds. These partial end(s) reshape the way we inhabit the planet. This reshaping implies also paradoxical outcomes, with the greening of Antartica happening almost at the same time as snow falling on a desert thousands of years old.

Speculating instead around the nexus of economy and geography, one of the key features of the catabolic turn is the potent return to forms of primitive accumulation and resource wars.[59] Since there are no other external civilizations with which "the world-civilization can enter into conflict," Italian sociologist Luciano Gallino claimed, various forms of unavailability can give rise to "endogenous conflicts".[60]

A clear example regarding this is the case of the Arctic. Global warming, by causing its melting, will soon lead to the opening of new navigable maritime routes and access to new resources. Notably, from a natural or pre-political space, the Arctic has recently

[57] Heinberg, *Power. Limits and Prospects for Human Survival*, 226.
[58] Mann and Wainwright, *Il nuovo Leviatano. Una filosofia politica del cambiamento climatico*, 171.
[59] Lind, "The coming resource wars," https://www.tabletmag.com/sections/news/articles/the-coming-resource-wars.
[60] Gallino, *Finanzcapitalismo*, 41.

become the focus of attention for governments as an imminent strategic opportunity. In 2018, the British House of Commons Defence Committee established, in a document titled *On Thin Ice: UK Defence in the Arctic*, that the Arctic may witness an increase in military activity.[61]

Thanks to climate change, the Arctic changes its ontopolitical status and becomes a contested area for its resources at the international level. According to some estimates, the Arctic Ocean might indeed be navigable as early as 2050.

According to Craig Collins, in a future where growth is destined to decrease, capitalism enters its catabolic phase, meaning it begins to devour itself. This recursive self-devouring of society (the only alternative to returning to a mere maintenance level) can be best explained by referring to the biochemical process of catabolism:

> The word "catabolism" comes from the Greek and is used in biology to refer to the condition whereby a living thing feeds on itself. Thus, *catabolic capitalism* is a self-cannibalizing system whose insatiable hunger for profit can only be fed by devouring the society that sustains it. As it rampages down the road to ruin, this system gorges itself on one self-inflicted disaster after another.[62]

Along the social axis, a catabolic turn implies, among other things, the descent of groups and individuals into various forms of violence, inflexibility, intolerance, and a proclivity for moral compromises. The socio-environmental entanglements behind such patterns are not historically new. As noted by Rhys Carpenter in his *Discontinuity in Greek Civilization*, it was heavy climatic events like droughts and harsh weather conditions that, on different occasions, generated real "cultural recessions"[63] in the ancient Greek world, ultimately leading to a final recourse to violence, as seen in the drought-stricken Mycenaean society.[64]

In other words, there is a recurring historical pattern of catabolic moments on a smaller scale throughout history, moments in which local extreme climate conditions may precipitate violence and political distress.

This contraction of global space, combined with the ever-expanding greed of capitalists and major nations, will, according to a projection by Heinberg, only worsen the status quo: "Capitalists will, out of necessity, seek to profit from the collapse of society and from conflict between regions".[65]

The contraction of space (both as concrete space and as a space of possibilities) does not equate to a contraction of the power exerted by capital. Rather, it means that power radicalizes and re-enacts forms of primitive accumulation based on violence, new enclosures, privatization, and do-it-yourself or vigilante types of security. On a larger

[61] "The change in the natural environment in the Arctic and High North is driving a change in the security environment. As the ice recedes and the Arctic becomes more accessible to navigation and the exploitation of its extensive natural resources, a region that has been characterised by low tension and multi-lateral co-operation has in recent years begun to see an increase in military activity" (House of Commons Defence Committee, "On thin ice: UK defence in the Arcitc", https://publications.parliament.uk/pa/cm201719/cmselect/cmdfence/388/388.pdf, 3).

[62] Collins, "Catabolism: Capitalism's frightening future," *Counterpunch*, 1 November, 2018. Already Paul Virilio talked about the possibility of a "capitalization of tragedies and catastrophes of all kinds", in *The Original Accident*, 12.

[63] Carpenter, *Clima e storia*, 31.

[64] *Ibid*., 90.

[65] Heinberg, Op. cit., 307.

scale, this is also true at the level of national governments. The shrinking of material spaces and resources signifies a concentration and verticalization of power, a pattern exemplified by the recent surge of so-called *strongmen* and authoritarian governments around the globe, as well as a more tightly woven amalgamation of economic power with military power.

In turn, the catabolic turn implies new perturbations of the Critical Zone, "as rare earth minerals, dwindling petroleum supplies, and water all become significantly more important than human labor".[66]

It is difficult to predict how our post-catabolic social structures will look and take shape. Crises of one type are entangled with concomitant crises of another. For example, in some communities the recent Covid-19 pandemic increased the incidence of food insecurity which, in turn, has fostered forms of resilience and community organizations.[67] The catabolic turn, therefore, must not be equated with apocalyptic nihilism. Its local manifestations also present an opportunity to rethink how sociality and politics can be reshaped to address the new constraints imposed by the catabolic scenario.

What is certain is that the ongoing ecological and anthropogenic influence on the Critical Zone, by plasticity altering its shape, simultaneously changes the essence of our terrestrial existence. Social and political resistance will have to partially rearticulate themselves accordingly.

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[66] Grove, Op. cit., 204.

[67] Demi, Sicchia, Dei, Gebremikael, and Shaw, "Resiliency against food insecurity among the Black population in Scarborough during the COVID-19 pandemic", 1-12.

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